



# Forest Health Protection

## Pacific Southwest Region



Date: September 21, 2004  
File Code: 3420

To: District Ranger, Truckee Ranger District, Tahoe National Forest

Subject: Field evaluation of the proposed Truckee Service Center project site  
(Report NE04-09).

On September 9, 2004, Forest Health Protection (FHP) staff evaluated conifers within the proposed Truckee Service Center project Site for current and future health concerns. The site visit was conducted at the request of Jerry Kent, District Timber Management Officer. Sheri Smith, Supervisory Entomologist and Bill Woodruff, Forest Pathologist reviewed the site along with Kris Boatner, Debby Broback, Larry Ford, Jerry Kent, Rick Maddalena, Amanda Shufelberger, and Randy Westmoreland.

The Tahoe National Forest is proposing to develop a 70-acre site located west of the 267 bypass, east of Donner Pass Road, south of I-80 and north of Glenshire Drive. This site is the proposed new location for the Truckee Ranger District office and several other Forest Service and Town of Truckee facilities. As part of the removal of trees for buildings and other facilities (approximately 30 acres), the District is also proposing to thin the remaining stands to improve forest health and identify and remove hazard trees.

Currently the site is occupied by 80-100 year old Jeffrey pine and a small amount of lodgepole pine. The lodgepole pines mix in some locations with the Jeffrey pine but are primarily found in clusters along the riparian area within the 70-acre site. Many of the trees will be removed for various facilities and parking lots, however, there will be some contiguous stands of trees that require management activities to meet the short and long term goals of the Service center.

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## Jeffrey pine

The primary concerns with the Jeffrey pine trees are attacks and subsequent mortality caused by Jeffrey pine beetle, *Dendroctonus jeffreyi* and the pine engraver, *Ips pini*. Beetles typically attack trees under stress caused by a variety of reasons. Although we noted a limited amount of current beetle activity, many of the locations are overstocked for the site. Basal areas of 210, 300 and 390 sq. ft/acre were recorded. Overstocked stands combined with drought conditions will result in levels of bark beetle-caused tree mortality and unplanned openings that are generally unacceptable for administrative sites. In addition, bark beetle-killed trees can become hazard trees depending on their potential for failure and relationship to targets.

### Management Alternatives

1. **Do nothing.** Bark and engraver beetle caused tree mortality or top kill (*I. pini*) will occur in these stands whenever the trees are stressed and susceptible to successful attack. The result of this alternative will be mortality at increasing levels, unplanned openings and the continued risk associated with hazard trees.
2. **Salvage as trees die.** Implementation of this alternative would result in the removal of dead trees when they occur. Some value may be realized and the immediate threat of hazard trees is reduced, however the underlying causes of stand/tree susceptibility are not altered to prevent/reduce mortality. Because of the "group kill" characteristic of Jeffrey pine beetle there may be openings larger than desired after salvage removal and some type of revegetation may be required.
3. **Thinning.** Management activities that promote tree health and vigor also reduce the susceptibility to bark beetle-related mortality. Thinning is the most effective silvicultural treatment available to restore conifer health. Thinning from below reduces flammable fuels and creates growing space for trees. In addition, opening up pine stands may prevent bark beetle pheromones from concentrating in a single location thus decreasing the likelihood of "group" kills caused by aggregating bark beetles. Silvicultural prescriptions can be developed to meet the overall objectives of maintaining tree health but these may be contrary to the goal of maintaining screening in some areas on the site. Fewer healthy, vigorous residual trees selected through thinning, resulting in less screening, may be a better management objective than maintaining conditions that are conducive to "group kills" by bark beetles in the future.

Select for a diversity of size and age classes among trees with healthy crowns and good needle retention when marking the trees. The few trees that have topkill should be selected against near roads and proposed facilities. During our evaluation we also noted that some of the Jeffrey pines on the site had a fork in their main stem. Trees that have tightly V-shaped crotches can split and break from the green weight of the foliage, heavy snow loads or internal decay. If trees with crotches are retained they should be evaluated regularly for cracks, splits and callus ridges that may be an

indication of weakening and predisposition to failure or infection by decay fungi. Prompt removal of windthrown or snow breakage pine material should limit infestations by slash breeding *Ips* beetles. Any green pine trees or pine slash remaining from construction or tree removal should be chipped, burned or removed from the site immediately to prevent infestation. Although red turpentine beetle (RTB) is not typically a cause for concern in general forest stands, within the administrative site it is recommended that tree removal occur after the main flight of red turpentine beetles (~ after June 15) to deter RTB attacks on stumps and possible spillover onto residual trees. If a post-spring harvest is not possible please conduct surveys of the residual trees and stumps for RTB attacks and notify FHP of your findings. Evaluation of additional management activities may be necessary.

Annosus root disease, caused by *Heterobasidion annosum*, is common in all conifer stands. Infection is spread from tree to tree by root contact, forming disease pockets in the stand that slowly expand. Infection of freshly cut stumps or new wounds by aerially spread spores creates new infection centers. Infected trees suffer root decay, butt decay, and root mortality. Infection results in reduced vigor, windthrow, predisposition to attack by bark and engraver beetles, and outright mortality. Treating freshly cut stump surfaces with a borate product can largely prevent stump infection by *H. annosum*. Sporax® is the only fungicide registered for controlling annosus root disease on stumps in California. In California, treatment of **all** stumps is required in recreational areas and administrative sites on National Forest Lands due to the high value of the trees.

### **Lodgepole pine**

Chronic levels of lodgepole pine mortality are occurring with the proposed site. Many of the existing live trees meet the characteristics of being highly susceptible to mountain pine beetle attack: greater than 8" DBH, greater than 80 years old, and existing in pure or nearly pure lodgepole type with a history of mountain pine beetle infestation in surrounding areas. Continued lodgepole pine mortality should be expected. The area occupied by the lodgepole is relatively small and most of the trees are within the riparian conservation area. Due to these factors and the high potential for windthrow associated with lodgepole pine, thinning of this species is not recommended for this site. The need to remove dead trees can be evaluated as they occur.

### **Protecting trees from construction damage.**

Trees can be damaged or killed by a wide variety of construction activities. Some practices lead to obvious injuries such as broken branches or torn bark. Open wounds of this type deplete a plant's energy resources and provide entry points for insects or diseases. Often times during construction or other management activities the worst damage to trees often remains hidden underground. It is critical on desired residual trees to protect roots that lie in the path of construction.

**Site Clearing/ Thinning.** Removal of a large number of trees exposes the residuals to new conditions. Sudden increases in amounts of sunlight and wind can stress trees. Thinning in areas where high winds are a common occurrence should be conducted with extreme caution.

**Soil Compaction.** Limiting soil compaction around high value trees is highly recommended. Tree roots need loose soil to grow, obtain oxygen, and absorb water and nutrients. Heavy machinery, stockpiling of building materials and excessive foot traffic can all damage soil structure. Lack of good soil aeration can cause roots to suffocate and tree health to decline.

**Avoid activities within the primary root zone.** The primary root zone is typically defined as the "dripline" or the area directly below the branches of the tree. It should be noted, however, that roots can extend beyond the longest branches and measures should be taken whenever possible to protect additional area beyond the dripline.

Moving large amounts of soil within the primary root zone usually kills a tree. Except where absolutely necessary, avoid disruptions to the natural contour of the site or shift them well outside the primary root zone.

As much as 40 percent of a tree's root system could be cut during trenching or road building. This reduces water and nutrient uptake, and may compromise the stability of the tree. Sidewalks, driveways and roads located too close to a tree endanger its health and may threaten pavement stability. Factors such as frost heaving, poor drainage, and pavement flaws give roots an opportunity to expand, gain a foothold, and cause damage.

### **Vegetation Management Plan**

A vegetation management plan that would incorporate planned thinnings, regeneration of open areas and takes into account the management goals and objectives for the Service Center site would be useful. To be most effective, hazard tree evaluation and treatment plans should also be incorporated into the vegetation management plan. Adjacent land owners/managers should be encouraged to thin surrounding stands to improve/maintain tree health.

Forest Health Protection (FHP) can assist in evaluating hazard trees and developing a vegetation management plan. In addition, FHP prevention/suppression funds can be requested for bark beetle prevention thinning, but cannot be used to remove dead and/or hazard trees. If you are interested in pursuing prevention funding, have any questions regarding this evaluation or need further assistance please contact the FHP staff at 530-257-2151.

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